

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF APPEALS AND INTERFERENCES

In re Application of:

BONG-JIN-LEE

Serial No.: 08/876,179

Examiner: GUSHI, ROSS

Filed: 13 June 1997

Art Unit: 2833

For: A HARD DISK DRIVE WITH CONNECTORS THAT SIMPLIFY ASSEMBLY  
(as amended)



**APPEAL BRIEF**

Assistant Commissioner  
for Patents  
Washington, D.C. 20231

Sir:

Pursuant to Applicant's Notice of Appeal filed on 7 June 1999, Applicant hereby appeals to the Board of Patent Appeals and Interferences from the final rejection of claims 1 through 8 and 10 through 18 dated 5 January 1999 (Paper No. 7).

Folio: P54596  
Date: 8/9/99  
I.D.: REB/kf

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## **I. REAL PARTY IN INTEREST**

Pursuant to 37 CFR §1.192(c)(1)(as amended), the real party in interest is:

SamSung Electronics Co., Ltd.  
#416, Maetan-dong, Paldal-gu  
Suwon-city, Kyungki-do, Republic of KOREA

as evidenced by the Assignment executed by the inventor on 30 June 1997 and recorded in the U.S. Patent & Trademark Office on 31 July 1997 at Reel 8806, frames 0591.

## **II. RELATED APPEALS AND INTERFERENCES**

There are no other appeals and interferences known to Appellant, Appellant's legal representatives, or assignee, which will directly affect, be directly affected by or have a bearing on the Board's decision in the pending appeal.

## **III. STATUS OF CLAIMS**

Claims 1 through 8 and 10 through 18 are present and all of these claims stand finally rejected and the final rejection of all of these claims has been appealed.

## **IV. STATUS OF AMENDMENTS AFTER FINAL**

An Amendment After Final was filed in the USPTO on April 5, 1999. The Examiner has unconditionally refused to enter this amendment as stated in two separate Advisory Actions.

## **V. SUMMARY OF THE INVENTION**

The present invention, as noted in the Summary of the Invention section beginning on line 1 of page 3 and ending on line 17 of page 3 of Applicant's specification pertains to an apparatus for a hard disk drive containing a printed circuit board and a head/disk assembly containing another printed circuit board. When the printed circuit board and the head/disk assembly are joined together, two pairs of connectors are automatically joined so that no further manipulation is needed to form electrical contact between the printed circuit board and the head/disk assembly. One pair of the connectors may be hook like so that the terminals automatically electrically make contact when the printed circuit board is joined with the head/disk assembly.

## **VI. ISSUES ON APPEAL**

Claims 1 through 8 and 10 through 18 have been finally rejected by the Examiner under 35 USC 112, second paragraph because the Examiner said that it is not clear as to whether there is one or two printed circuit boards being claimed in independent claims 1, 6 and 12. Accordingly, it is an issue for appeal as to whether or not it is clear that there are two printed circuit boards claimed in independent claims 1, 6, and 12.

Independent claims 1, 6 and 12 have been finally rejected under 35 USC 102 under Takagi and/or Morehouse. Accordingly, it is an issue for appeal as to whether the reference(s) of Takagi and/or Morehouse do in fact teach each and every limitation described in independent claims 1, 6, and 12.

Claims 2, 4, 5, 7, 10, 11, 13, 14, 15, and 16 have been rejected under 35 USC 103 (a) as being unpatentable over Morehouse *et al.* in view of Kaufman. Accordingly, it is an issue for appeal as to whether the features of claims 2, 4, 5, 7, 10, 11, 13, 14, 15, and 16 are rendered obvious in view of Morehouse *et al.* in view of Kaufman.

## **VII. GROUPING OF CLAIMS**

Claims 1, 6, and 12 have been rejected under 35 USC 102 as being anticipated by Takage and/or Morehouse. It is submitted that claims 1, 6, and 12 do not stand or fall together for the following reasons:

Claim 6 and 12 disclose a "printed circuit board assembly" having "a base" while claim 1 does not claim "a base". Claim 12 claims "a plurality of elastic terminals attached to said base" while claim 6 claims "a plurality of terminals attached to said base" thus making claim 6 not restrictive to elastic terminals.

Claims 2, 4, 5, 7, 10, 11, 13, 14, 15, and 16 have been rejected under 35 USC 103 as being unpatentable over Morehouse *et al.* in view of Kaufman. It is submitted that these claims do not stand or fall together for the following reasons:

Claim 2 pertains to terminals of an elastic material, claim 4 pertains to terminals being P-shaped, claim 5 pertains to terminals being C-shaped, claim 7 pertains to terminals formed of a flexible material, claim 10 depends from 7 and pertains to terminals being P shaped, claim 11 depends from claim 7 and pertains to terminals being C-shaped, claim 13 depends from claim 12 and pertains to terminals being C-shaped, claim 14 depends from claim 12 and pertains to terminals being P-shaped, claim 15 pertains to terminals being hook shaped, and claim 16 pertains to terminals being V-shaped. Claims 17 and 18 do not have any art rejections applied thereto but pertain to terminals being 14 pin or 4 pin respectively.

### **VIII. ARGUMENTS**

The Examiner has rejected claims 1 through 18 under 35 USC 112, second paragraph. Applicant traverses this rejection. The Examiner states that independent claims 1, 6, and 12 are vague and ambiguous for reciting a "printed circuit board" and a "printed circuit board assembly". The Examiner has stated that it is not clear as to whether there is one or two printed circuit boards. The Applicant has stated in the reply that there are two printed circuit boards, one being "a printed circuit board" and the other being "a printed circuit board assembly". Applicant has tried to clarify

this in the response by claiming one printed circuit board "a first printed circuit board" and the other "a second printed circuit board". The Examiner has refused to enter such Amendments and says that such Amendments are not persuasive and would constitute new matter resulting in substantial consideration. Applicant contends that there would be no substantial consideration as one printed circuit board is called "a printed circuit board" and the other is called "a printed circuit board assembly". In the Detailed Description of the Invention section, one is referred to as "printed circuit board 10" and the other is referred to as "head/disk assembly 20". Applicant contends that there is therefore no new matter. Applicant also contends that since Examiner raised the issue of whether or not there are two printed circuit boards is evidence that the Examiner should have considered that there might be two printed circuit boards and that Examiner's contention that considering such would require "substantial consideration" is without merit.

The Examiner has rejected claim 1 under 35 U.S.C. 102(e) as being anticipated by Takagi *et al*'860. Although the Examiner identified a head/disk assembly, a printed circuit board assembly, a first connector and a second connector that connects to said first connector, the Examiner has not identified a printed circuit board, a plurality of contacts mounted on said printed circuit board, or a plurality of contact connectors mounted on said printed circuit board assembly that contact said plurality of contacts mounted on said printed circuit board when said second connector is engaged with said first connector. In summary, the Examiner has ignored the essence of the invention, that being two pairs of connectors from two different printed circuit boards automatically connecting

with each other when the two printed circuit boards are joined together. The first pair of electrical connectors being the first connector and the second connector and the second pair of electrical connections being the plurality of contacts and the plurality of contact connectors. The two printed circuit boards are the printed circuit board and the printed circuit board assembly. All of these elements were claimed in claim 1 and the Examiner has ignored many of these features. Similarly, all these elements were claimed in claim 6 and the Examiner has again ignored these features.

The Examiner has also rejected claims 1 and 6 under 35 U.S.C. 102/103 in view of Morehouse *et al.* '049. As with the previous rejection, the Examiner has failed to point out the features of a printed circuit board, a plurality of contacts mounted on said printed circuit board, or a plurality of contact connectors mounted on said printed circuit board assembly that contact said plurality of contacts mounted on said printed circuit board when said second connector is engaged with said first connector.

The Examiner has stated in the final office action (paper No 7) that "the 35 USC 102 rejections as stated in the first office action are still applicable. Thus, claims 1, 6, and 12 are rejected under Takagi and/or Morehouse for the reasons given in the first office action." However, claim 12 did not exist at the time of the first office action. Like claims 1 and 6, claim 12 has a "printed circuit board" having "a first connector" and "a plurality of contacts" which mates to a "printed circuit board

assembly" having "a second connector" and "a plurality of elastic terminals". The first connector mates with the second connector and the plurality of contacts mates with the plurality of elastic terminals automatically and simultaneously when the printed circuit board is joined with the printed circuit board assembly. Neither Takagi nor Morehouse disclose two pairs of electrical connectors that mate with each other when two printed circuit boards are joined together. For these reasons, Applicant contends that claims 1, 6, and 12 are distinguished over the prior art.

With regard to claims 2, 4, 5, 7, 10, 11, 13, 14, 15, and 16, the applicant claims terminals being elastic, C-shaped, P-shaped, hook shaped or V-shaped. The Examiner rejects these claims because Kaufman discloses J-shaped spring portion terminals. The Examiner states, "it would have been obvious to one with ordinary skill in the art that the terminals being described as "J-shaped" in Kaufman could as well be described as "C-shaped", "Hook shaped," "P-shaped," or "V-shaped" or be configured in these shapes without altering the functionality of the terminals." Applicant traverses this rejection. Applicant contends that there is no *prima facie* showing that it would be obvious to change the shape. It is irrelevant that the claimed shapes functions the same as J-shaped terminals. Applicant contends that it is not obvious to substitute these shapes for J-shaped terminals.

## IX. CONCLUSION

In view of the law and facts stated herein as well as all the foregoing reasons, Appellant believes that the rejection is improper and respectfully requests that the Board refuse to sustain the outstanding rejection of claims 1 through 8 and 10 through 18 under 35 U.S.C. §112, second paragraph and 35 U.S.C. §102 and 35 U.S.C. §103.

Respectfully submitted,

  
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**APPENDIX IX.**

**CLAIMS UNDER APPEAL**

1. (Amended) A hard disk drive, comprising:
  - 2 a disk assembly, comprising:
    - 3 a body;
    - 4 a spindle motor supported by said body;
    - 5 a first connector attached to said body;
    - 6 a printed circuit board attached to said body and connected to said spindle motor; and
    - 7 a plurality of contacts mounted on said printed circuit board;
    - 8 a printed circuit board assembly, comprising;
    - 9 a second connector engageable with said first connector of said disk assembly while said
    - 10 printed circuit board assembly is attached to said disk assembly; and
    - 11 a plurality of contact connectors, comprising;
    - 12 said printed circuit board assembly bearing a bore; and
    - 13 a plurality of terminals attached to said printed circuit board assembly and protruding through
    - 14 said bore; and
    - 15 said contact connectors of said printed circuit board assembly electrically engaging said
    - 16 contacts on said disk assembly to transfer signals between said printed circuit board and said spindle

17 motor when said second connector of said printed circuit board is engaged with said first connector  
18 of said disk assembly.

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1 2. (Amended) The hard disk drive of claim 1, further comprised of said terminals being  
2 formed of an elastic material.

1 3. (Amended) The hard disk drive of claim 2, further comprised of said printed circuit  
2 board attached to said disk assembly being flexible.

1 4. (Amended) The hard disk drive of claim 3, further comprised of said terminals being  
2 P-shaped.

1 5. (Amended) The hard disk drive of claim 3, further comprised of said terminals being  
2 C-shaped.

1 6. (Amended) A hard disk drive, comprising:  
2 a disk assembly, comprising:  
3 a body;  
4 a spindle motor disposed on said body;

5           a first connector attached to said body;  
6           a printed circuit board disposed on said body and electrically connected to said spindle  
7           motor; and  
8           a plurality of contacts mounted on said printed circuit board; and  
9           a printed circuit board assembly bearing a bore and comprising;    a base;  
10           a second connector attached to said base; and  
11           a plurality of terminals attached to said base and protruding through said bore to abuttingly  
12           contact said contacts on said disk assembly while said first connector is engaged with said second  
13           connector.

1           7.       (Amended) The hard disk drive of claim 6, further comprised of said terminals being  
2           formed of a flexible material.

1           8.       (Amended) The hard disk drive of claim 7, further comprised of said printed circuit  
2           board on said disk assembly being flexible.

1           10.      (Amended) The hard disk drive of claim 7, further comprised of said terminals being  
2           P-shaped.

1           11.      (Amended) The hard disk drive of claim 7, further comprised of said terminals being

2 C-shaped.

1 12. A hard disk drive, comprising:

2 a disk assembly, comprising:

3 a body;

4 a spindle motor disposed on said body;

5 a first connector attached to said body;

6 a flexible printed circuit board disposed on said body and electrically connected to said

7 spindle motor; and

8 a plurality of contacts mounted on said printed circuit board; and

9 a printed circuit board assembly bearing a bore and comprising; a base;

10 a second connector attached to said base; and

11 a plurality of elastic terminals attached to said base and protruding through said bore to

12 abuttingly contact said contacts on said disk assembly while said first connector is engaged with said

13 second connector.

1 13. The hard drive of claim 12, further comprised of said terminals being C-shaped.

1 14. The hard drive of claim 12, further comprised of said terminals being P-shaped.